

## ABSTRACT

Some embodiments provide a memory cell comprising a body region doped with charge carriers of a first type, a source region disposed in the body region and doped with charge carriers of a second type, and a drain region disposed in the body region and doped with charge carriers of the second type. According to some embodiments, the body region, the source region, and the drain region are oriented in a first direction, the body region and the source region form a first junction, and the body region and the drain region form a second junction. Moreover, a conductivity of the first junction from the body region to the source region in a case that the first junction is unbiased is substantially less than a conductivity of the second junction from the body region to the drain region in a case that the second junction is unbiased. Some embodiments further include a transistor oriented in a second direction, wherein the second direction is not parallel to the first direction.